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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/676,256

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EXAMINER

MRUK, GEOFFREY S

ART UNIT

PAPER NUMBER

2853

DATE MAILED: 01/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/676,256

Applicant(s)

TAKAHASHI, TOMOAKI

Examiner

Geoffrey Mruk

Art Unit

2853

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 September 2005.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-13 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1, 3-7 and 9-13 is/are rejected.
7) ☒ Claim(s) 8 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 21 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3-5, 7, and 9-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Katakura et al. (US 5,453,770).

With respect to claim 1, Katakura discloses a liquid ejecting apparatus (Column 1, lines 6-11) comprising

- a liquid ejecting head (Fig. 2) having a plurality of nozzle openings (Fig. 4b, element 31) for ejecting liquid drops arranged in line, wherein said liquid ejecting head has a flow path unit (Fig. 4b, element, 37) having a plurality of pressure chambers (Fig. 4b, element 35) respectively interconnected to said plurality of nozzle openings,
- a plurality of elastic walls (Fig. 4b, element 34) for respectively forming one face of each of said plurality of pressure chambers, and
- a nozzle plate (Fig. 4b, element 30) where said plurality of nozzle openings are formed and
- a piezoelectric actuator unit (Fig. 4b, element 40) which includes a plurality of piezoelectric vibrators (Fig. 4b, array of element 40)

Art Unit: 2853

respectively joined to said plurality of elastic walls via insular parts (Fig. 4b, element 43), deforms said elastic walls by deformation of said piezoelectric vibrators, and changes the volume of said pressure chambers (Column 5, lines 15-51),

- said plurality of piezoelectric vibrators are respectively formed by alternately laminating piezoelectric material layers (Fig. 6, element 52) and electrode layers (Fig. 6, element 50) and have active parts (Fig. 6, free end side – Column 6, lines 39-54) capable of performing piezoelectric deformation which are joined to said elastic walls, and
- said piezoelectric actuator unit further has a pair of unit fixing parts (Fig. 4b, elements 41, 42) installed on both sides of said active parts in a vibrator width direction perpendicular to an arrangement direction of said plurality of nozzle openings (Fig 4a, element 31), and
- said pair of unit fixing parts (Fig. 4b, elements 41, 42) are joined to parts of said flow path unit (Fig. 4b, element 37) other than said plurality of elastic walls of said flow path unit, thereby said piezoelectric actuator unit is fixed to said flow path unit (Column 5, lines 15-51),
- wherein at least one of said pair of unit fixing parts comprises a plurality of inactive parts (Column 5, lines 20-21) incapable of performing piezoelectric deformation formed integrally with said active parts in said vibrator width direction as a part of each of said plurality of piezoelectric vibrators.

Art Unit: 2853

With respect to claim 3, Katakura discloses at least one of said pair of unit fixing parts (Fig. 4b, elements 41, 42) comprises a fixing member (Fig. 4b, elements 41, 42), which is formed as a separate member from said plurality of piezoelectric vibrators (Fig. 4b, array of element 40) and is joined to said plurality of piezoelectric vibrators (Column 5, lines 15-51).

With respect to claim 4, Katakura discloses said fixing member (Fig. 4b, elements 41, 42) is joined to said plurality of piezoelectric vibrators (Fig. 4b, array of element 40) via a base member (Fig. 4b, elements 36 and inactive portion of element 40) joined to said plurality of piezoelectric vibrators (Column 5, lines 15-51).

With respect to claim 5, Katakura discloses said pluralities of piezoelectric vibrators (Fig. 4b, array of element 40) are respectively formed independently and are integrally fixed by said base member (Column 5, lines 15-51).

With respect to claim 7, Katakura said base member (Fig. 4b, elements 36 and inactive portion of element 40) is formed by free-cutting ceramics (Column 6, lines 19-22).

With respect to claim 9, Katakura discloses a plurality of said piezoelectric actuator units (Fig. 4b, array of element 40), wherein a plurality of nozzle rows composed of said plurality of nozzle openings are formed, and said piezoelectric actuator units are respectively arranged for each nozzle row (Figs. 4a and 4b).

With respect to claim 10, Katakura discloses the plurality of elastic walls (Fig. 5, element 34) comprise a part of an elastic plate covering all of said plurality of pressure chambers (Fig. 4b, element 35), and a plurality of insular movable thick

Art Unit: 2853

parts (Fig. 4b, element 43) which are formed in correspondence with said plurality of pressure chambers and to which respective said active parts of said plurality of piezoelectric vibrators are joined, first fixed thick parts to which said inactive parts of said piezoelectric vibrators are joined, and second fixed thick parts to which said unit fixing parts are joined are installed on a face of said elastic plate on a side of said actuator unit (Column 5, lines 15-51; Column 6, lines 41-54).

With respect to claim 11, Katakura discloses a total width of said pair of unit fixing parts (Fig. 4b, elements 41, 42) in said vibrator width direction is wider than a width of said active part (Fig. 4b, element 43) in said vibrator width direction.

With respect to claim 12, Katakura discloses at least one of said pair of unit fixing parts (Fig. 4b, elements 41, 42) is joined to an end of said active part in said vibrator width direction and parts of said fixing members joined to said ends of said active parts are formed integrally with said plurality of piezoelectric vibrators in a comb-teeth shape (Column 5, lines 15-51; Column 6, lines 41-54).

With respect to claim 13, Katakura discloses a plurality of nozzle openings (Fig. 4a, element 31) are formed in two rows and are staggered between said nozzle rows, and each of said plurality of piezoelectric vibrators (Fig. B, array of element 40) includes a half on one side in said vibrator direction and a half on the other side in said vibrator width direction, either of said half on one side and said half on the other side forms said active part, and the other half forms an inactive part incapable of performing piezoelectric deformation (Column 5, lines 15-51; Column 6, lines 41-54), an arrangement of said active part and said inactive part

Art Unit: 2853

is opposite between adjacent piezoelectric vibrators, and said active parts are arranged in correspondence with said nozzle openings (Figs 4a, 4b).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Katakura et al. (US 5,453,770) in view of Cuhat et al. (US 6,664,716 B2).

Katakura discloses liquid ejecting apparatus according to claim 4 or 5.

Katakura fails to disclose a tape carrier package electrically connected to said plurality of piezoelectric vibrators, wherein said tape carrier package includes an integrated circuit for driving said plurality of piezoelectric vibrators and a rear of said integrated circuit is fixed to said base member at least partially.

Cuhat discloses a flexible printed circuit used to connect the active components (Column 4, lines 54-61) and an integrated circuit (Fig. 4).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to use the flexible printed circuit disclosed by Cuhat in the ink-jet recording head of Hosono. The motivation for doing so would have been "the use of a flexible printed circuit in the present invention makes it easier to connect

Art Unit: 2853

the active components mounted on the structure to the external electronic circuitry” (Column 4, lines 54-61).

Allowable Subject Matter

Claim 8 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

The examiner makes of record that the previous drawing, specification and claim objections dated 26 May 2005 are withdrawn in view of applicant's remarks.

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will

Art Unit: 2853

the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Geoffrey Mruk whose telephone number is 571 272-2810. The examiner can normally be reached on 7am - 330pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on 571 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

GSM
1/9/2006

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1/9/06
MANISH S. SHAH
PRIMARY EXAMINER